

Introduction

Given the variety of skills and expertise required for Digital Humanities (DH) projects, researchers in this area must work with others to achieve their research objectives. Typically, these projects involve academics, undergraduate and graduate students, research assistants, computer programmers, librarians, and others who may be locally, nationally, or even internationally located. A priority for these teams is finding methods to ensure effective communication and collaboration, particularly when team members are geographically dispersed.

To their advantage, DH researchers are comfortable in the electronic world given their focus on the creation of digital tools for the study of the Humanities. As a community, Digital Humanists have been among the early adopters of many digital tools for research and communication, which has, in turn, created new opportunities for collaboration ([Unsworth](#)). Email, as most can attest, is a popular communication tool, often used even to contact someone who might be located just down the hall. In addition, documents are routinely shared electronically by email or uploaded to a website, rather than distributed in a physical form. Skype and other Voice-Over Internet Protocol (VOIP) systems have replaced the telephone for many conference calls.

These digital tools facilitate communication and collaboration, and allow people across many geographical locations to coordinate tasks and research output. At times, given the extensive use of digital tools, teams may have an over-reliance on these tools to the exclusion of other equally beneficial ones. Other means to facilitate communication, coordination, and collaboration exist and can play an important part in effective research. In particular, teams might explore the role that in-person interaction can play alongside digital tools within these collaborations. This raises the issue of balance between online and in-person interactions and the use of tools which can facilitate this balance within collaborative working relationships.

This paper explores the role of both digital and in-person collaboration tools and considers the need for a balance between them within the context of DH research teams. First, the uses, benefits, and trade-offs of various communication channels are outlined. Subsequently, the application of these various channels within DH research teams and the impact those channels have on collaboration will be explored by drawing upon interviews with members of DH teams. Finally, best practices and recommendations for DH research teams and funding agencies will conclude the paper.

Context

To be effective, a research team must find ways to communicate and collaborate in order to develop trust; build consensus around research questions, methodologies and tasks; and coordinate the actual work. Within this context, communication plays two primary roles. At a basic level, communication facilitates the sharing of the information needed to define, implement, and coordinate tasks. Discussions enable team members to outline tasks, determine appropriate responsibility, and report progress, moving the entire research project towards its objectives. Second, communication builds a working relationship among team members through the creation of a common understanding of the research project as a whole. A productive working relationship fosters collaboration and builds trust while ensuring effective and efficient communication patterns.

Academic teams, particularly those which are geographically dispersed and/or interdisciplinary, face challenges in developing these effective work relationships. The potential for conflict is great and stems from differences and ambiguity in the research problem and terminology. In addition, academic training often does not prepare individuals for the levels of interdependence required within team research ([Birnbaum](#)).

Further, geographically dispersed teams face additional challenges. Cramton defines geographically dispersed teams as "groups of people with a common purpose who carry out interdependent tasks across locations and time, using technology to communicate much more than they use face-to-face meetings" (346). These teams may differ in degrees of "virtuality," with some collaborating solely through online means while others combine digital communication with face-to-face meetings (Poole and Zhang). While communication in all forms provides the backbone to effective collaboration, even small geographical distances between group members reduce the amount of communication between them. This communication gap may be further complicated by the fact that virtual teams also often have members who come from different cultural backgrounds as well as different organizations (Cramton and Webber). As a result, geographically dispersed teams must carefully evaluate their communication patterns to ensure that they are supporting the collaborative relationship.

Communication and collaboration is conducted in several ways, depending on the location of the sender and receiver and the time difference between when the message was sent and received, as seen in Table 1. Each type employs a different technology and presents benefits and tradeoffs.

Table 1: Categorization of Communication/Collaboration Channels (Precup, O'Sullivan, Cormican and Dooley)

	Same time	Different times
Same place	Face-to-face collaboration	Asynchronous collaboration (email, listserves, wikis)
Different places	Distributed synchronous (conference calls via telephones and VOIP, instant messaging)	Distributed asynchronous collaboration (email, listserves, wikis)

By definition, face-to-face communication is synchronistic, in that it occurs when the sender and receiver are in the same place at the same time. This form is the richest media of all the communication channels because it allows for both the sender and receiver to observe cues such as facial expressions, tone of voice, and other body language, all of which add context to the verbal message. Given this potential for immediate feedback from the various cues within discussions, participants can react quickly and provide or ask for further clarification (Connaughton and Daly; Hinds and Weisband; Cramton). This communication channel also allows team members to learn about each other, thus contributing to the development of trust and commitment to the project (Connaughton and Daly; Kraut, Galegher, and Egidio). Used at the outset of a project, face-to-face discussions can facilitate the development of project vision, tasks, group interaction guidelines, coordination mechanisms, and research objectives and outcomes. These issues are often ambiguous, have potential for conflict, or are very complex in nature (Connaughton and Daly; Gibson and Cohen; Poole and Zhang). These discussions become particularly important in software development projects—of which there are many examples in the DH community—where tasks and individuals are interdependent and where there is a great deal of uncertainty associated with tasks and outcomes (Cramton and Webber). Following these personal connections, the collaborative relationship can be sustained through subsequent telephone and electronic communication channels (Connaughton and Daly). Despite the increasing reliance on electronic communication, the need for face-to-face interaction has not diminished, even in the 20 years since Daft et al. argued for these types of interaction (Daft, Lengel, and Trevino).

Despite the advantages of face-to-face communication, geographically dispersed teams face tradeoffs if they intend to interact in-person. First, travel time and costs can limit the frequency of such meetings, which can then slow decision making and project planning. In addition, unlike electronic communication tools such as emails and listserves, no automatic record is created from these meetings (Lewis). Consequently, a team member must be assigned to create this record to guide team members after the meeting.

Emails and other text-based asynchronous communication tools are another channel often used in collaborations. These forms overcome some barriers that are inherent in face-to-face communication because the sender and receiver do not have to be in the same place at the same time. In addition, this method is relatively inexpensive, especially when compared to the cost of travel. In addition, project updates can be sent to many people at once and quickly without waiting for a meeting. This can become particularly important when team members are distributed across a wide geographical area. Finally, with the ability to create archives (permanent records of decisions), tasks and deadlines are easily tracked ([Finholt, Sproull, and Kiesler](#); [Poole and Zhang](#)).

Despite the advantages discussed above, text-based communications present many challenges. Producing this form of communication can be time-consuming and may require more effort than verbal communication. In some cases, people type slowly and, in the interest of saving time, may omit details that they would be more likely to share orally. Moreover, some team members might be reluctant to communicate certain details in writing, knowing that a permanent record is automatically being created. The time delays associated with text-based communication may limit the ability of all team members to participate in decision making in a timely manner given delays in accessing emails ([Warkentin, Sayeed, and Hightower](#); [Cramton and Orvis](#)). While emoticons might be considered to parallel the visual cues of in-person communication, as discussed above, text-based communication does not provide all the cues present in face-to-face communication. This can make developing consensus or resolving conflict difficult to do over email ([Cramton](#); [Warkentin, Sayeed, and Hightower](#); [Poole and Zhang](#)). Finally, given the complex and ambiguous nature of many academic research projects, email may not be the most effective means to resolve "complex problems about conceptual and methodological developments" ([Newell and Swan 1308](#)).

Conference calls, either by telephone or VOIP, and instant messaging/chat rooms come closer than text-based communication to achieving the sense of "same space" inherent in face-to-face communication. They also allow for real-time communication and feedback, and transmission of some important cues ([Daft, Lengel, and Trevino](#)). However, conference calls come with their own challenges. During a call, people may talk over each other, an annoyance which can be further complicated by time lags and other problems in transmission. And like face-to-face meetings, a person must be assigned to create a permanent record. In the case of instant messaging, those individuals who type slowly may be left out of the conversation ([Warkentin, Sayeed, and Hightower](#)).

In the end, each team must determine the best methods for communication and collaboration given the various benefits and tradeoffs among these communication channels. One tool which can guide decision making in this regard is the hierarchy of richness proposed by [Daft et al.](#), as shown in [Figure 1](#). This hierarchy suggests that the richer communication channels be used for those conversations that involve ambiguous issues or have potential for conflicts. Written communication is better suited to information sharing in a timely manner.

Figure 1: Hierarchy of richness ([Daft, Lengel, and Trevino](#); [Connaughton and Daly](#); [Poole and Zhang](#))

Hierarchy of richness (Daft, Lengel, and Trevino; Connaughton and Daly; Poole and Zhang)

From this discussion of context, the manner in which DH teams draw upon collaboration tools, digital and otherwise, to facilitate their research will be explored, drawing upon a study of DH research teams.

Methodology

This paper draws upon a study examining research teams with the DH community. This research uses a

qualitative approach with in-depth interviews with members of various multi-disciplinary, multi-location project teams in Canada, the United States, and the United Kingdom. The interview questions focus on each participant's definition of a team, their experiences working in teams, and the types of support and research preparation required to ensure effective and efficient research results. As part of the interviews, participants discussed their use of online tools for communication and collaboration (as per [Marshall and Rossman; McCracken](#)).

During data analysis, a grounded theory approach was taken to focus on the themes that emerged from the data. This analysis was broken into several steps. First, the data was organized, read, and coded to determine categories, themes, and patterns. These were tested for emergent and alternative understandings, both within a single case and across all of the cases. This was an iterative process, involving movement between data, codes, and concepts, constantly comparing the data to itself as well as to the developing theory. The literature was also drawn upon to support the interpretation and understanding of the data ([Glaser and Strauss; Marshall and Rossman](#)).

Results and Discussion

The eleven individuals interviewed are currently (and have been previously) part of a diverse range of team DH projects, in terms of research objectives, team membership size, budget, and geographical dispersion. These teams were based either within the participant's home institution, nationally, and/or internationally. The roles played by each participant are varied and include research assistant, researcher, computer programmer, and lead investigator, among others. Within their work, these individuals and their teams rely on face-to-face communication, conference calls, emails, listserves, wikis, and blogs. Rather than making a pure distinction between the in-person and virtual, the communication channels are categorized as text-based or verbal. As discussed below, most conference calls are conducted over the internet, placing them in the virtual realm.

These groups can be classified as geographically dispersed teams, using [Cramton](#)'s definition. The teams have a common research purpose which requires the coordination of interdependent tasks. The members are often in different geographical locations, even when working at the same institution. In many cases, the geographical dispersion introduces a time element, in that team members may be located in different time zones. Canadian and American teams face a particular challenge in this regard, especially as compared to research teams made up only of British participants. Given these constraints, these teams draw heavily on digital, text-based tools for communication and collaboration.

At one level, the above results are as one expects. Given the nature of research within DH, teams show an affinity for electronic communication within their collaboration. At another level, however, despite the community's networked relationship, the need for face-to-face communication has not disappeared. This particular point will be explored further below. A summary of the various communication and collaboration channels and uses is outlined in [Table 2](#), below.

The text-based tools used by these teams include wikis, blogs, websites, email, listserves, shared online project spaces, and instant messaging. For example, many teams establish wikis and blogs for keeping records of decisions, tasks, and deadlines. Emails and project listserves are particularly useful for sharing information quickly with many people. To facilitate this, teams generally establish rules for listserves to ensure that information is sent to all team members without the need to determine in advance who might need to know. Some teams also use instant messaging for quick exchanges in real time. These various tools prove to be particularly effective for those teams whose members are geographically dispersed and very busy.

However, despite all the benefits of text-based communication methods, the participants identified some

challenges with these methods. For example, wikis are often perceived by group members as one more task to add to an already full schedule. In addition, participants were disappointed that wikis have not yet fulfilled their expectations as a way to write collaboratively. They felt that this change may come as people become more familiar with the software and with the collaborative writing process. Of course, all participants identified the challenge of overflowing email inboxes and the fact that some team members do not respond to emails in a timely manner, if at all. Finally, the participants found that it is difficult to bond with other team members and create the personal connections necessary for trust and accountability over email. To overcome the often impersonal nature of email, one team posted all members' pictures on their project bulletin board and ensured that the photos accompanied all postings. While this was thought initially to be slightly "hokey," the use of photos accompanying written communication has been useful in creating personal connections within their geographically dispersed team.^[1]

These research teams also draw upon verbal communication channels. Regular conference calls are standard for many teams, though the telephone has been replaced to a large extent by Skype and other VOIP systems. This community appears to be among the early adopters of this technology. Besides conference calls, the various research teams also use face-to-face meetings to facilitate collaboration, although the frequency of face-to-face meetings varies according to the team and project. The importance and value of these verbal conversations should not be underestimated. From these discussions, the crucial atmosphere of personal obligation is created. To paraphrase one participant, people do not necessarily feel personally responsible for the work or team unless they meet or communicate by phone. The face-to-face meetings are particularly important for resolving conflict and creating a sense of team. One participant stated that yearly team meetings served two primary purposes. First, the gatherings are an opportunity to review the previous year's work and outline the tasks for the upcoming year. Second, they are also the time to resolve those "thorny" issues that could not be easily resolved on conference calls or by email during the year. One participant noted that breakthroughs came when people met together. The meetings are also a time to have a meal with wine, "leaving everyone happy as they leave."

Another participant echoed this thought with a similar experience. This team's planning consisted of the formal agenda as well as dinner and drinks. These two different types of interactions serve to reinforce the working relationship that sustains the team through the project's stresses and strains. Another participant observed that a research group did not feel like a team when there was too much time between meetings. Finally, several participants commented on the value of conferences as avenues for personal communication and opportunities to continue developing personal relationships.

Besides yearly project meetings, some research teams schedule face-to-face work time. These opportunities provide concentrated time, often away from home institutions and daily commitments, for team members to work on assorted project tasks. The participants who used these types of interactions stressed that the time was not meeting time, but rather work time that facilitated clearly identifiable progress on project tasks. Ultimately, in-person meetings helped to redirect everyone's focus back to the project and its objectives.

As can be seen, these teams draw upon the media rich channels for their most complex discussions, which are those focused on resolving conflict, planning work and deadlines, and creating productive working relationships. The face-to-face meetings are critical in this regard with the combination of formal agenda and informal discussions over meals. To date, the teams interviewed have not found a way to replicate these interactions within the online environment. Again, the use of these media rich channels becomes important for developing the relationship that sustains the project once teams return to working in the electronic environment. The less media rich channels such as emails, listserves, wikis, blogs, and online project spaces are useful for information sharing and recording keeping.

Table 2: Tools, Uses, and Drawbacks

	Text	Verbal
Types of Communication and Collaboration Tools	<ul style="list-style-type: none"> • Wikis • Blogs • Websites • Email/listserves • Online project spaces • Instant messaging 	<ul style="list-style-type: none"> • Face-to-face (formal and informal meeting) • Conference calls (telephone and VoIP)
Uses	<ul style="list-style-type: none"> • Recordkeeping/archives • Information sharing/reporting progress in timely manner 	<ul style="list-style-type: none"> • Meals/drinks as motivation • Create personal connections/bonding • Create a sense of team/commitment and obligation to the project • Social atmosphere • Deal with "thorny" issues • Develop workplans • Scheduled work time on project tasks
Drawbacks	<ul style="list-style-type: none"> • Seen as one more thing to do • Easy to ignore • Difficult to create personal connections 	<ul style="list-style-type: none"> • Time/travel/costs • Difficult to demonstrate progress/results on conference call

Implications for Practice

These results provide several implications for practice as teams collaborate on research projects.

Perhaps the primary implication is the need for a balance between digital tools and in-person interactions. Technology can supplement, but cannot replace, the importance and impact of face-to-face in collaboration. The balance between two sets of interactions will change over time to according to different research objectives and the relationship between the team members ([Kraut, Galegher, and Egidio](#)). A greater use of digital tools may be possible on a research project in which participants have an extensive history of collaborating with each other.

To maximize the efficiency of the research team, this balance needs to be built into project plans and budgets. As discussed, the in-person interactions not only allow for project planning, but also provide the opportunity for team members to learn about each other on both professional and personal levels. [Handy](#) argues that the more a team operates virtually, the more team members must create opportunities for face-to-face interactions. These meetings should focus on process and facilitate "the getting to know each other," rather than solely facilitating tasks. This creates the trust which comes from being part of a community. These meetings are particularly important at the beginning stages of a project. It is at this stage of research projects where the ambiguity and potential for conflict is greatest, especially when individuals from different academic backgrounds and training are involved, and when team members must develop a common understanding of the research project, methodologies, tasks, and deadlines ([Cramton; Salas, Sims, and](#)

[Burke](#)). These initial meetings set the foundation upon which team members can build to operate effectively and efficiently in the virtual environment. However, regular face-to-face meetings should also be scheduled to address the hard discussions that can be difficult to conduct over email and also to reinforce the sense of team.

As research teams move forward, project leaders and other team members might consult the hierarchy of media richness to determine the appropriate channel for communication and collaboration for a particular issue. For discussions, particularly those about potentially contentious issues, face-to-face meetings or conference calls might be the most appropriate method of communication. Dedicated work time as a team is also a possibility for deliberate forward movement on particular project tasks, as argued by [Ruecker, Radzikowska, and Sinclair](#). On the other hand, text-based communication might be the most appropriate method for record keeping, document storage, and project reporting. As community members become more comfortable with wikis and similar tools such as Google Docs, on-line collaborative writing might become more popular.

Research teams must also communicate regularly through a variety of channels to develop and sustain collaborative relationships. This practice enables team members to share information and build trust and excitement in the project ([Gibson and Cohen](#); [Poole and Zhang](#)). Geographically dispersed teams may also find that time zones can create a sense of isolation among team members ([Poole and Zhang](#)). Regular communication, especially that which incorporates the personal, can mitigate this. In these cases, personal communication can include discussing things not related to project goals, such as the weather and family, topics that are typical of the type of interaction that occurs between colleagues who meet in the hall or at mailboxes. Posting pictures to project websites can also be useful in this regard.

Finally, the informal communication that occurs at non-project meetings, such as conferences, should not be underestimated as an important communication channel. These opportunities can further facilitate building trust among team members.

The effective management of team communication and collaboration can also provide the team with an opportunity for advocacy with granting agencies. Within Canada and other countries, funding agencies strongly encourage collaboration between researchers across institutions, as well as collaboration with members of the community ([SSHRC From Granting](#); [SSHRC Council News](#); [Knights and Willmott](#); [Newell and Swan](#)). Social Sciences and Humanities Research Council of Canada ([SSHRC](#)) grants such as the Community–University Research Alliances (CURA) and the Major Collaborative Research Initiatives (MCRI) are just two examples that require large-scale collaboration between individuals and organizations. To achieve the level of collaboration that these grants require, researchers must argue for increased funding for travel and hospitality. As argued above, face-to-face meetings are an important collaboration tool which cannot be easily replaced with digital tools.

Conclusion

As can be seen, team research projects are an integral part of Digital Humanities. These teams employ a variety of tools in their collaboration. While digital tools are widely used, interviewed members of this community stress the need for a balance between online and in-person interactions. Face-to-face meetings come with benefits that have not yet been replicated in the digital environment, and are needed to establish an effective working relationship of trust and accountability. To be effective in their collaboration, DH teams must plan their communication as carefully as their research.

Notes

[1] Comments from interviewees are presented anonymously in this paper.

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